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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,680	09/29/2000	Megumi Yamaoka	MAT-8021US	3463

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EXAMINER

CHANG, JON CARLTON

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 12/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/676,680

Applicant(s)

YAMAOKA ET AL.

Examiner

Jon Chang

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 12-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restrictions

1. Applicant's election without traverse of Invention I (claims 1-11) in Paper No. 7 is acknowledged.

Claim Objections

2. Claims 1, 7 and 8 are objected to because of the following informalities:
 - a) In claim 1, at line 13, "learning-local-segment" should read, --learning-local-segments--.
 - b) In claim 7, at line 10, "local-segment" should read, --local-segments--.
 - c) In claim 8, at line 21, "a learning-local-segments" should read, --a learning-local-segment--.

Appropriate correction is required.

Specification

3. The disclosure is objected to because of the following informalities:
 - a) On page 15, lines 22-23, state, "Fig. 11 illustrates same-type window data stored in same-type window database 843." However, the figure does not appear to show this.
 - b) On page 16, at line 2, it appears that "image of each object" should read, --learning image--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 2-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) In claim 3, use of the term "character" is not clear. For example, the at lines 3-4, the claim recites, "...registering the learning image into the learning image database by a character of an object..." Lines 6-8 recite, "...extracting...by the character," and lines 9-11 recite, "...counting...by the character."

b) Claim 2, at lines 8-9, recites, "all the some of the learning-local-segments." This is not clear. See also claim 4, at line 4.

c) Claim 5, at lines 5-6, recites, "each absolute of the difference." This is vague. See also claim 6.

d) Claim 5, at lines 7-8, recites, "has minimum one of the sum." This is not clear. See also claim 6.

5. Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a) Claim 1, in step (f), recites, "counting a pair of one of the local-segments and learning-local-segment from which a first position is estimated to determine a score for

the first position." This language indicates that the score is determined by counting a **single pair of either** the local-segments or the learning-local-segments. Counting one pair always results in a count of one. Further, it is not understood how one taking a pair of local-segments, or a pair of learning-local-segments can determine a score for a position. It would appear that a pair consisting of a learning-segment and a learning-local-segment would be needed to determine an appropriate score. The specification does not adequately explain this processing. Claims 2, 7, 8, 9 and 11 have a similar recitation.

b) Claim 3 requires, "registering the learning image into the learning image database by a character of the object to be identified," "extracting the learning-local-segment...by the character," and "counting a pair ...by the character." This is not understood. The disclosure does not explain what this "character" is, how the learning image is registered "by a character," how the extraction is made "by the character," or how the counting is performed "by the character."

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,463,176 to Matsugu et al. (hereinafter "Matsugu").

As to claim 1, Matsugu discloses an image recognizing method comprising the steps of:

- (a) dividing an input image into local-segments (column 5, lines 9-12);
- (b) registering a learning image into a learning image database (column 5, lines 28-30);
- (c) extracting a learning-local-segment which is similar to one of the local-segments from the learning image database (column 5, lines 28-30; each local feature element pattern is the learning-local-segment);
- (d) relating the learning-local segment extracted in the step (c) to the one of the local-segments (column 5, lines 28-42);
- (e) estimating a position of an object-to be identified in the input image from coordinates of the one of the local-segments and coordinates of the learning-local-segment (column 4, lines 58-59; column 8, lines 6-9);
- (f) counting a pair of one of the local-segments and learning-local segment from which a first position is estimated to determine a score for the first position (column 8, lines 6-18); and
- (g) judging that the object to be identified is present at the first position when the score is greater than a predetermined number (column 8, lines 6-18).

Regarding claim 2, Matsugu discloses an image recognizing method comprising the steps of:

(a) dividing an input image into local-segments (column 5, lines 9-12; column 11, lines 27-29));

(b) dividing a learning image into learning-local-segments having a same size as the local-segments and making a group of some of the learning-local-segments which are similar to each other (column 11, lines 27-29 and 52-58); column 5, lines 27-28);

(c) registering image data of a representative learning-local-segment of the group and coordinates of all the some of the learning-local-segments into a same-type window database (column 11, lines 52-58);

(d) extracting a representative learning-local-segment which is similar to one of the local-segments from the same-type window database (column 11, lines 39-50);

(e) relating the one of the local-segments to a group of which the representative learning-local-segment extracted in the step (d) (column 11, lines 60-64);

(f) estimating a position of an object to be identified in the input image from coordinates of the one of the local-segment and coordinates of the representative learning-local-segment of the group (column 12, lines 3-5);

(g) counting a pair of one of the local segments and a representative learning-local-segment from which a first position is estimated to determine a score for the first position (column 11, line 60 to column 12, line 7); and

(h) judging that the object to be identified is present at the first position when the score is greater than a predetermined number (column 12, line 12-16).

With regard to claim 3, as best understood, Matsugu discloses the image recognizing method according to claim 1, wherein:

said step (b) comprises the step of registering the learning image into the learning image database by a character of an object to be identified (column 9, lines 41-46; the "character" is area information, i.e., a characteristic);

said step (c) comprises the step of extracting the learning-local-segment which is similar to the one of the local-segment from the learning image database by the character (column 9, lines 41-46); and

said step (f) comprises the step of counting a pair of one of the local-segments and a learning-local-segment by the character (column 10, lines 15-16).

As to claim 4, Matsugu discloses the image. recognizing method according to claim 2, wherein said step (c) comprises the step of registering image data of the representative learning-local-segment of the group and coordinates of all the some of the learning-local -segments in the group and a character of an object to be identified -into the same-type window database (column 11, lines 52-58; column 12, lines 3-4).

Regarding claim 5, Matsugu discloses the image recognizing method according to claim 1, wherein the step (d) comprises the steps of: (d-1) calculating a sum of one of (i) each square of a difference between a pixel value of the one of the local-segment and a pixel value of the learning-local-segments (column 5, lines 31-33) and (ii) each absolute of the difference, and extracting a pair of one of the local-segments and a learning-local-segment which has minimum one of the sum (column 5, lines 34-42); and

(d-2) relating the one of the local-segment to the learning-local-segment in the pair extracted in said step (d-1) (column 5, lines 27-30).

Regarding claim 6, Matsugu discloses the image recognizing method according to claim 2, wherein said step (e) comprises the steps of:

(e-1) calculating a sum of one of (i) each square of a difference between a pixel value of the one of the local -segment and a pixel value of the representative learning-local-segment (column 5, lines 31-33) and (ii) each absolute of the difference, and extracting a pair of one of the local-segment and a representative learning local-segment which has minimum one of the sum (column 5, lines 34-42); and

(e-2) relating the one of the local-segment to the representative learning-local-segment in the pair extracted in said step (e-1) (column 5, lines 27-30).

Claim 7 is an apparatus claim which corresponds to method claim 1. The discussion provided above for claim 1 is applicable to claim 7, in view of Matsugu's apparatus (e.g., Fig.1A).

Claim 8 is an apparatus claim which corresponds to method claim 2. The discussion provided above for claim 2 is applicable to claim 8, in view of Matsugu's apparatus (e.g., Fig.1A).

With regard to claim 9, the discussions provided above for claims 1, 3 and 7 are applicable.

As to claim 10, Matsugu discloses the image recognizing apparatus according to claim 8, wherein said learning means includes:

similar window integrating means for making a group of some of the learning-local-segments which are similar to each other stored in the learning image database and for releasing image data of a representative learning-local-segment of the group and coordinates of all the some of the learning-local-segments in the group (column 11, lines 52-58; column 12, lines 3-4); and

same-type window database for storing the image data of the representative learning-local-segment of the group and the coordinates of all the some of the learning-local-segments in the group (column 11, line 35; storage unit A4).

Claim 11 is drawn to a computer-readable storage medium holding a program for making a computer carry out an image recognizing method, the method corresponding to the method of claim 1. The discussion provided above for claim 1 is applicable to claim 11. Note that Matsugu's apparatus (Fig.1A) is a CPU-based system, which inherently includes a computer-readable storage medium. Note also column 5, lines 1-3.

References Cited

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,101,441 to Yamaguchi teaches as prior art partitioning template and image, and calculating sum of absolute differences (column 1, lines 20-27).

U.S. Patent 5,642,434 to Nakao et al. teaches as prior art using sum of absolute value of differences to locate an object corresponding to a template in an image (column 1, lines 12-20).

U.S. Patent 6,301,387 to Sun et al. teaches as prior art dividing a template and an image into blocks and performing correlation based on block average (column 1, lines 32-45).


U.S. Patent 6,584,213 to Prakash et al. discloses locating the position of a segment in a frame using matching based on the sum of absolute differences.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.


Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
December 1, 2003